

EXTENSION + CHALLENGE ☺

Name _____

Simplify each down to one equation that $\equiv 0$.

Set 1: Example $\frac{x-1}{x+6} - \frac{x-6}{3x+1} = \frac{x+4}{3x+1} + \frac{x-6}{3x+1}$
 $+ \frac{x-6}{3x+1}$

$$\frac{x-1}{x+6} = \frac{2x-2}{3x+1}$$

$$(3x+1)(x-1) = (x+6)(2x-2)$$

$$3x^2 - 2x - 1 = 2x^2 + 10x - 12$$

$$\boxed{x^2 - 12x + 11 = 0}$$

$$1. \frac{x}{x-1} - \frac{x+1}{x+2} = \frac{x-1}{x+2}$$

$$2. \frac{x-6}{x-1} + \frac{x-4}{x+7} = \frac{x+2}{x+7}$$

$$3. \frac{x-10}{x-9} + \frac{x-3}{x+1} = \frac{x+9}{x+1}$$

$$4. \frac{x-2}{x-1} - \frac{2x-7}{2x+4} = \frac{x+1}{2x+4}$$

$$5. \frac{x-9}{x-7} + \frac{x-10}{x+9} = \frac{2x-7}{x+9}$$

$$6. \frac{x-15}{x-3} + \frac{x}{x+12} = \frac{x+6}{x+12}$$

$$7. \frac{x+4}{2x-4} - \frac{x-5}{3x+2} = \frac{2x+3}{3x+2}$$

$$8. \frac{x+8}{2x+1} - \frac{3x-4}{4x+2} = \frac{x-4}{4x+2}$$

$$9. \frac{x+8}{x+10} + \frac{x-13}{x-5} = \frac{2x+2}{x+10}$$

$$10. \frac{x+1}{2x+2} + \frac{x-1}{2x+2} = \frac{x}{x+1}$$

$$11. \frac{2x+2}{x-1} + \frac{2x-7}{x+3} = \frac{7x+2}{3x-3}$$

$$12. \frac{x+7}{2x+2} - \frac{x+2}{x+1} = \frac{-3x+3}{5x-5}$$

$$13. \frac{3-x}{2x} + \frac{x+1}{x-1} = \frac{9x+1}{4x}$$

$$14. \frac{x-4}{x-1} + \frac{x-3}{x+6} = \frac{2x-3}{x+6}$$

$$15. \frac{x+1}{3x+2} + \frac{2x-1}{x+2} = \frac{4x+1}{3x+2}$$

$$16. \frac{2x-1}{2x} - \frac{x}{x+1} = \frac{x-2}{4x}$$

SET 2:

$$\text{Ex: } \frac{4x}{x-1} + \frac{3x}{x+1} = 7$$

$$\frac{4x(x+1) + 3x(x-1)}{(x-1)(x+1)} = 7$$

$$\frac{4x^2 + 4x + 3x^2 - 3x}{x^2 - 1} = 7$$

$$7x^2 + x = 7(x^2 - 1)$$

$$7x^2 + x = 7x^2 - 7$$

$$x = -7$$

$$1. \frac{x-2}{x+1} + \frac{x-3}{x-1} = 2$$

$$3. \frac{x}{x+4} + \frac{2x-6}{x-3} = 3$$

$$5. \frac{3x}{6-2x} + \frac{5x+4}{2x+7} = 1$$

$$7. \frac{y+6}{y-3} - \frac{2y-4}{y-5} = -1$$

$$9. \frac{1}{y^2} - \frac{5}{y-1} = \frac{-5}{y}$$

$$11. \frac{x+2}{x+3} + \frac{2x+5}{x-2} = 3$$

$$2. \frac{x-3}{x+4} + \frac{2x+1}{x-4} = 3$$

$$4. \frac{x+4}{x-3} - \frac{2x-5}{x-2} = -1$$

$$6. \frac{2x}{4-2x} + \frac{3x+2}{x+4} = 2$$

$$8. \frac{x-5}{x-2} - \frac{3x-2}{x+1} = -2$$

$$10. \frac{2}{x^2} - \frac{6}{x-2} = \frac{-6}{x}$$

$$12. \frac{x-2}{x+4} + \frac{3x+2}{x-1} = 4$$